

# PATENT SPECIFICATION

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## COMPLETE SPECIFICATION.



### Improvements in Cowling for Aviation Engines for Minimising or Extinguishing Fire.

I, EMILE-FRANÇOIS-AUGUSTE PUECH, of French nationality, of 26, rue de Montbrison, Saint-Etienne, France, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

The object of the present invention is a fire screening cowl for aviation engines designed not only to impede the advance of any fuel fire breaking out around the engine, and to localise the flames to their point of origin, but also to enable extinction thereof with the only means on board.

It has already been proposed to cover the usual ventilating openings in the cowl with metal gauze or the like material which will confine flames within the cowl in the event of fire breaking out thereunder. According to the present invention a triple layered covering is used as described more fully below. The cowl preferably makes joint round the space it encloses by the interengagement of brushes having metal bristles and fireproof backings. According to a further feature of the invention, in order to extinguish any fire, conduits say of serpentine form are provided within the cowl through apertures in which fluid fuel may be injected to consume the oxygen in the enclosed space, or alternatively a fire extinguishing agent such as carbon tetrachloride. The conduits are preferably arranged with their apertures directed towards the covering of one or more ventilating openings so that if fluid fuel is injected the extra flames which consume the oxygen are as far away as possible from the parts of the engine.

The accompanying drawings illustrate the invention, but they are given only by way of example and are not to be understood as limitative.

The engine assembly including all parts and suitable associated piping is enclosed in a fire screening cowl 1. Figure 1 is a perspective view of such a cowl as used for Breguet 19 type 26—X aeroplanes. Naturally the shape of the cowl will vary in its form according to the engine and

aircraft.

The cowl 1 is provided with suitably disposed openings such as 2, 2<sup>1</sup>, 2<sup>2</sup>, 3, 3<sup>1</sup>, 3<sup>11</sup>, . . . . . designed to permit the desired ventilation of the engine. These openings are furnished externally with wings or flaps such as 4, 4<sup>1</sup>, 4<sup>11</sup>, . . . . . carried rearwards, so as to create in this way a zone of low air pressure.

A triple covering consisting of a layer of metal gauze of the type used in miners' lamps, a layer of foraminous fabric of amianthus, asbestos or the like of suitable mesh and a metal grip of suitable mesh, is placed against the interior surface of the cowl, either by bolting, soldering or other suitable method so as at least to cover the openings.

This triple covering which obviously only ensures an incomplete closure of the said ventilating openings has its three constituent layer pressed one against the other, it being understood that preferably the metal gauze is placed on the exterior, the fabric of amianthus next, and the grid on the engine side.

In the interior of the cowl, and in front of the openings partially closed by the triple layer are disposed serpentine conduits 5 connected either directly or indirectly to one or more of the petrol tanks through piping 6. The serpentine conduits are provided with apertures of suitable bore, disposition and spacing facing the ventilating openings.

Figures 2 and 3 show diagrammatically a simple form of such a serpentine conduit. Figure 2 is a view in plan from above, while Figure 3 is a side elevation looking from the corresponding ventilating opening.

The joints of the fire screening cowl are it will be understood suitable to the type of engines to be protected and are formed of fireproof backing fabric, preferably of a fabric of amianthus or the like and provided with steel bristles forming a brush. An illustration is given in Figures 4 and 5. These brushes by their mutual interpenetration provide an impenetrable barrier to flames which may accidentally arise under the cowl.

[Price 1/-]

The fire screening cowl as described above in no way impedes the normal ventilation of the engine, nor its normal working. On the other hand, it will be understood that such a cowl is just as those at present used, dismountable to permit the necessary access to the parts it encloses.

It is also clear that the body of the fire screening cowl can be of any suitable material, such for example as aluminium or the material sold under the registered trade mark "duralumin". Farther by way of precaution the engine supply pipes and leads could be reinforced, more particularly in the protected region.

The use of the cowl as an extinguisher is very simple and can be explained as follows:

When, for any cause, the petrol or oil becomes ignited, the flames emitted lick the walls of the cowl, including the region of the openings, and consequently the serpentine conduits which face towards them.

Since these openings are closed partially by grids or fabrics of fireproof material, the result is that the said flames already cooled by their contact with the first grid, are still further cooled by the amianthus, and finally coming against the fine metallic fabric they no longer have sufficient heat to traverse it.

It suffices to direct petrol at this moment into the serpentine conduits from the tank, or from pumps provided for this purpose. This petrol is thus projected against the closing grids thus considerably activating the combustion. This acceleration of combustion has the effect of very rapidly consuming the oxygen contained in the space isolated by the cowl. The flames then go out of themselves.

It will be understood that the serpentine conduits could, instead of with petrol, be supplied with any suitable extinguishing agent, such for example as carbon tetrachloride.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is:—

1. A fire screening and extinguishing cowl for use with aviation engines having ventilating openings therein covered with a triple covering comprising a layer of fine metal gauze preferably outermost, a layer of foraminous fabric of amianthus or the like preferably in the middle and a metal grip preferably innermost.

2. A fire screening and extinguishing cowl according to claim 1 the joints whereof are made by means of interengaging brushes having metal bristles and fireproof backings for instance of amianthus.

3. A fire screening and extinguishing cowl according to claim 1 in which conduits say of serpentine form are arranged inside having apertures by which fluid fuel or a fluid extinguishing agent such as carbon tetrachloride can be directed into the cowl.

4. A fire screening and extinguishing cowl according to claim 3 in which the apertures are located so that the fluid is directed towards the covering of the ventilating openings.

Dated this 4th day of July, 1932.

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*[This Drawing is a reproduction of the Original on a reduced scale.]*

Fig. 1.

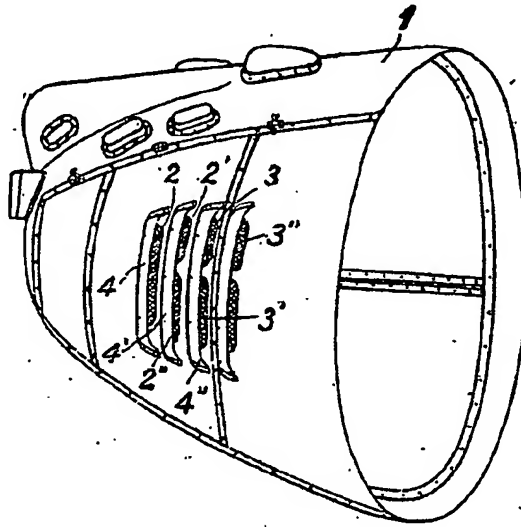


Fig. 2.

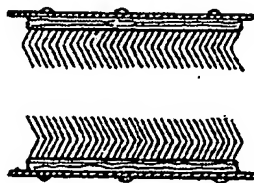
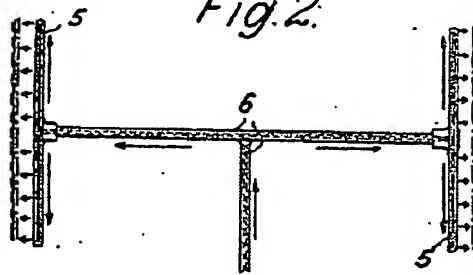


Fig. 4.

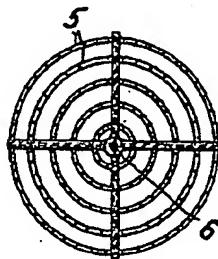


Fig. 3.

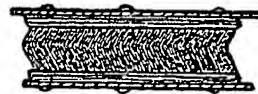


Fig. 5.